

the calculations and views in this paper for your consideration with the utmost diffidence, and with the humble hope that whether borne out, or otherwise, they will draw such attention to the real requirements of industrial progress as is demanded by, and only consistent with, the prospective interests of Victoria.

ART. XII.—*Museums in Victoria.*—By FREDERICK MCCOY, Esq., Fellow of the Geological Society of London, Honorary Fellow of the Cambridge Philosophical Society, and Professor of the Natural Sciences in the University of Melbourne. *note note in this leaf opp. p. 1*

THE use of museums, as a means of conveying valuable practical information to the masses of the public, has only of late years been perceived by the British people. It is only recently that the British Government has imitated the course pursued by the rulers of all the civilized states of Europe and America, and established practical Government Museums in the three kingdoms, under the titles of Museum of Practical Geology, Government School of Mines and of Science applied to the Arts, Museum of Economic Geology, Museum of Irish Industrial Resources, Museum of the School of Fine Arts, &c., and very many of even the better informed classes of the public cling to the old notion of a museum being at best a place merely for innocent amusement of schoolboys and idlers; a place, like Shakspeare's Apothecary's shop, where

—————“ a tortoise hung,
An alligator stuff'd, and other skins
Of ill-shaped fishes”

might be gaped at, and where such other dusty odds and ends as stray contributors might give, should be locked in cases, without labels or classification, or other essentials, to make them useful—in fact, the more incomprehensible the objects, the better is the estimation of the lovers of these old fashioned “ raree-shows ”—and it is only within the last few years that our countrymen are beginning to find out that, under proper direction, and as managed in modern times, museums become the most ready and effectual means of communicating the knowledge and practical experience of the experienced few, to the many who, under less favourable circumstances, are

engaged in, or mean to enter upon, those useful pursuits of life which depend more or less directly upon a knowledge of the peculiarities of the raw materials which Nature furnishes to us.

It has been suggested to me that as some even of our scientific fellow colonists held these old notions, a few observations on modern museums in general, and suggestions for the formation of such as would be useful to the people of this colony, might prove acceptable; and I have accordingly put the few following notes together to offer you this evening, placing them under separate heads, for convenience of reference.

GENERAL OBSERVATIONS.

All the more enlightened nations of Europe have long found it profitable to vote annually considerable sums for the prosecution of scientific researches, and the maintenance of museums in all the principal towns in which the eye of the unlearned could be familiarised with natural objects, with the principles of classification applied to them by scientific men to place their peculiar characters and mutual relations in a striking light; and with specimens and models of machinery illustrative of the arts and manufactures. Such museums, more or less good, exist, endowed from the public purse, in nearly all the large University Towns of the Continent of Europe; such the United States have been organising at great expense, in connection with the Government Natural History and Geological Surveys during the last twelve or fourteen years; and such the Board of Trade have more tardily established at home with the most gratifying success. For Victoria, I have no doubt that, with slight modifications, the series of museums established by the British Board of Trade would form the best precedents. They may be divided into Museums of Natural Science and its applications, and Museums of Art. Although these are partially combined in all cases, yet the division is useful, and I shall treat the two kinds separately.

MUSEUMS OF NATURAL AND APPLIED SCIENCES.

These have for their object the exhibition to the public of examples of all the natural products of the earth, or particular parts of it, carefully labelled with the name, the locality whence obtained, and such other information as would indicate the nature or uses of the particular object. And as every country possesses natural resources with which it is the in-

terest of the community to be acquainted, it has been recognised as an imperative duty by all intelligent governments, to have surveys and collections made by competent persons of all such things, and to have the results of such investigations, whether specimens of the animal, vegetable, or mineral kingdoms, deposited in some scientific establishment, where they could be carefully preserved for public instruction, and be freely open to public inspection, and where they should remain for verification, in after times, of the data on which the various Government Reports, &c., were founded.

The Victorian Government initiated measures of this kind long ago, and by His Excellency, Mr. Latrobe, a Government Botanist (Dr. Müller) was appointed to collect all the plants of the district, and report on those furnishing timber fit for various purposes, and those affording the various valuable gums, dyes, medicines, tannin, &c., which it might be expected the plants of the country would yield to the manufacturer acquainted with their appearance and properties. A Government Zoologist (Mr. Blandowski) was also appointed, who has made a highly attractive collection of most of the indigenous birds and mammals, as well as of a considerable number of the shells, sponges, &c., and a few of the fishes of the neighbouring sea. A Government Geologist (Mr. Selwyn) was also appointed, and brought out from England, to examine and report upon the rocks of the country, and to combine his observations into a geological map, to be published by the survey department; to make such a geological survey as the Board of Trade is having made for the United Kingdom, in connection with the School of Mines and Museum of Economic Geology in London; or such as Professors Hall, Rodgers, Emmons, &c., are doing for the United States, or such as Haidinger is superintending at Vienna for the Austrian Government.

Having been myself, many years ago, a member of the Geological Survey of Great Britain, which is the finest in the world, I am in a position to speak of the first-class excellence of the work already performed by our Government Geologist, and to say, that the map and sections now preparing for publication, are such as any country might be proud of: they are on the same plan as those of the British Survey, and are quite worthy of being placed beside them. The extent of country surveyed by him is also remarkable, when the difficulties under which he laboured, from having so small a staff, and insufficient topographical maps, are considered.

The Surveyor-General, too, with that zealous love of applied science, and skill in command, by which work of extraordi-

nary goodness is got out of ordinary workmen, for which his corps has become so famous at home and abroad, has made great and useful collections for the public, of the rocks, building stones, ores, soils, &c. of this country; which collections he could (if there was a place to hold them) increase to any extent without appreciable cost to the Government, by directing the attention of his surveyors to those matters which necessarily come under their notice in the daily discharge of their field duty.

All these works, accumulating the materials for a National Museum, were commenced long ago by the Victorian Government, and are continued to the present day. I am also informed that, two or three years ago, the Government had determined to appoint a Director of the Museum, in accordance with the system pursued at home in the great national museums to which I have alluded. This officer has been found by experience to be absolutely necessary for the satisfactory carrying out the objects of such institutions. At home the office is always filled by some man of established reputation and varied scientific knowledge—Haidinger, the great mineralogist, for instance, has been appointed by the Emperor, Director of the Vienna Museum; Prince Charles Lucien Buonaparte, one of the most accomplished of living naturalists, has been appointed Director of the Paris Museum; Sir Henry De la Beche, and, at his death, Sir Roderick Murchison, received the appointment of Director of the London Museum of Practical Geology, with its branches of Natural History and School of Mines. Sir Robert Kane is Director of the Government Museum of Irish Industrial Resources, including the Survey Natural History Collections, and it was understood that the corresponding office in Scotland was to have been filled by the late Professor E. Forbes, in connection with his Professorship of Natural Sciences in the Edinburgh University. It is to be regretted that this office was not filled up at the time, as from the known zeal of the gentleman indicated to me as at that time willing to undertake the duties, we might now have had the advantages of a harmonious action between all branches of the public service, able to advance the end in view; and by a judicious direction of each into the proper channels of inquiry, and impartiality and skill in dealing with the results of the various labours for the public benefit, the various materials really obtained might be combined into a valuable public collection.

Another obstacle to the formation hitherto in Victoria of a great National Museum, was the want of a suitable

building to hold the specimens. The town having now the large Museum built expressly for the purpose by the University, and part of the ground floor of the Public Library, removes this obstacle to the bringing the scattered fragments of collections together; and although we have as yet no complete Museum, it will be seen that we have the materials for a very great and good one, and unusually favourable opportunities for completing it on the most approved plans.

§ a. BOTANICAL MUSEUM.

Collections for the exhibition of classically arranged plants are of two sorts: 1st, Botanic Gardens for living specimens; 2nd, Herbaria for dried plants. Both kinds should be fostered; and accordingly both kinds have already made considerable progress in Victoria.

The public Botanic Gardens, under the able superintendence of Mr. Dalachy, afford the citizens the most delightful promenades, amongst well kept flower borders, trim walks, a rich collection of flowering shrubs and herbaceous plants, and the most beautifully situated piece of landscape gardening that can be conceived in this country. But as here (very properly I think) beauty of arrangement has been permitted to dominate over the grim precision and gridiron-like order of a strictly scientific Botanic Gardens for class purposes, I have been furnished by the Council of the University with means for the formation of a Botanic Garden of this latter kind, which is now being laid out, and with the help of Mr. Dalachy, and many other public and private rearers of plants, who have promised their aid, we expect to have within the year a good collection, illustrative of all the natural *Classes*, *Orders*, and most of the *Families*, and many of the *Genera* of plants, arranged with the systematic precision of the leaves of a book, and fully labelled in the way adopted by my friends Professor Henslow and Mr. Babington in the new University Botanic Garden at Cambridge. Each *Class* having a large bed to itself, with a label bearing its name in the centre, of such a size, that it can be read from any part of the margin: this bed is divided by small fences into smaller divisions, containing each one of the subordinate *Orders* of the *Class*, these again being subdivided into *Families*; and these into compartments for the *Genera*; each subordinate division in the classification being marked by a conspicuous, but progressively smaller, label, until finally the *Species* placed in each generic compartment have ordinary

sized labels, setting forth the *Genus*, *Species*, *Locality*, and common name of each. A garden well labelled in this manner will teach the principles of botanical classification, even if but poorly furnished with plants, and the eye of the visitor will familiarise him insensibly with the natural alliances and affinities of the various groups of plants, and suggest the relations which the scientific botanists have detected and used for their classification, even when as yet we may be deficient in many of the typical specimens. These, I have every hope, however, will not long be wanting.

The Government Herbarium, collected by Dr. Müller, contains a collection of dried specimens of great value, of most of the native plants of Victoria. This hitherto has been tied up in bundles, and kept in the little cottage in the Botanic Garden, where the workmen took their meals and slept, and where, consequently, visitors would scarcely like to intrude. It has now been transferred by the Commissioner of Public Works to the University, where it will be most carefully preserved, as the original specimens on which the printed reports of Dr. Müller were founded. It is at present undergoing a thorough repair, I having found living larvæ half an inch long, and numerous destructive *Termes*, *Psaci*, and the like, ruinously at work in the first parcel which came under my care. We are having a suitable case made for its reception in the new University Museum, where, in a month or two, it will be ready for reference. The very intelligent University gardener, W. Hyndman, is forming a supplementary Herbarium of the introduced plants, including those coming into flower in the Botanic and other gardens. Mr. Wilhelmi, the assistant Government botanist, will furnish us with a suite of his South Australian plants; and I have written home for an extensive Herbarium of the plants of other countries for comparison.

A museum of this sort should have, however, in addition to the above, a well-prepared suite of preparations and dissections, illustrating all the parts of plants, examples of all the tissues, the organs, with their more striking modifications of development in flower and fruit. All the structural peculiarities which have received particular names in the writings of botanists, should be illustrated by typical prepared examples, to which full descriptive labels should be attached, so as to clear, as much as possible, difficulties from the way of persons entering upon the study. A still more serious defect in the present public botanic collection, in the mind of one who likes to see science applied to the useful purposes of life, is the absence of speci-

mens of the useful vegetable products of the colony. It is of importance to the community to have publicly exhibited examples of all our native woods, from the timber excellent for shipbuilding, and those good for house carpentry, and of special utility for certain parts of machines, to our most beautiful black-wood, and other rich sorts, for fine cabinet-makers' work; the latter in manufactured and polished pieces. We should also have well-prepared specimens of the tannin from our bark; our indigo and other dyestuffs, our gums and other medicinal products, should appear as they might be prepared for the market. Sir W. Denison's experience of the facility with which potash can be manufactured from the ashes of our forest trees, should be illustrated by samples of the prepared alkali of the ash, and of the timber it was from, with descriptive labels. It would be the duty of a "Director of the Museum" to see that such specimens as these were procured and exhibited, for though of the highest interest to the public, they are almost sure to be neglected by the enthusiastic scientific collector, because no *scientific* interest attaches to them, and such observers, led away by the desire for novelty and many distinct species, are apt to forget that these are but the means to an end, and that those "merely useful" matters, instead of being neglected, should be brought prominently forward.

§ b. ZOOLOGICAL MUSEUM.

Zoological Museums are either local or general: the first being as complete a series of species as possible of some particular locality; the latter being principally generic types from all parts of the world.

It unfortunately happens in this, as in other departments of science, that the showy and useless has received more attention than the apparently insignificant creatures that for good or for evil most concern mankind. Thus the natural history of Birds has usurped a most undue share of attention: Quadrupeds have been less studied or collected; and some of the more economically important lower groups are almost unknown. Thus there is scarcely a moderately perfect collection of Fishes in existence, although the fisheries of various countries are of such high importance to man. Thus scarce a year passes but some of the German princes expend a large part of their income to fee scientific commissioners to examine and report upon some of the minute beetles, or other insect destroyers of their pine forests,

although if the museums were supplied with the small and ugly creatures as abundantly as with the showy ones, the insects would long ago have been perfectly well known to every entomologist of Europe. Sir Wm. Denison figures and describes the *Lymnoria terebrans*, a little crustacean no bigger than a pin's head, which he convicted of the destruction of the sub-marine piles in Tasmania while he was Governor there, which a less acute observer might have supposed to have simply rotted; yet, so inveterate is the habits of collecting only pretty things for museums, that this creature is almost unknown in Europe, where it has been described by three different observers, under three different names; and when I was last in the company of a great English authority on entomology and minute crustacea, I surprised him by the assertion that the *Mylostoma* of Allman, which destroys the wooden piers on the Irish coast, was this same little creature, which Della Chiagi had long before described at similar mischief on the piers of the Two Sicilies. Then, again, when the Hessian fly appeared first in numbers in Europe, and a famine was dreaded from the destruction it occasioned to the wheat crops, there was scarcely a museum in Europe contained a specimen, and the creature was supposed to be unknown, simply because then, as now, it was not the fashion to collect the smaller *Diptera*. The fly which kills the vine—the fly which destroys the turnip crops by eating the two first young leaves—and, in fact, the great majority of the insect annual destroyers of millions worth of property, are rarely to be met with in museums. Here, again, is another instance of the necessity of having always a Director at the head of any publicly endowed Museum, independent of the collectors; for they say, with some reason, that they must make some show, or the *οἱ πολλοί* will think them idle; and if they looked after these matters, a year's collecting might fit in a hat, and they might lose their situation. A superior officer, to come between them and judgment, is, therefore, necessary. The known Mollusca (*Teredo*), Crustacea (*Lymnoria*), and insects most destructive to property, whether growing crops or manufactured timber, one of each, put together, would fit in a wine glass; yet, for the public service, it is far more necessary that they should be collected and investigated than all the most brilliant birds and butterflies the world ever saw.

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